

DEC 17 2001

STATE OF CALIFORNIA

CALIFORNIA INTEGRATED WASTE MANAGEMENT BOARD

**Base Year Modification Request Certification**

**Part 1: Generation Study - No Extrapolation Diversion Data**

To request a substitution for a previously approved base year used in calculating the diversion rate for your jurisdiction, please complete and sign this form and return it to your Office of Local Assistance (OLA) representative at the address below, along with any additional information requested by OLA staff. When all documentation has been received, your OLA representative will work with you to prepare for your appearance before the Board. If you have any questions about this process, please call (916) 341-6199 to be connected to your OLA representative.

Mail completed documents to:

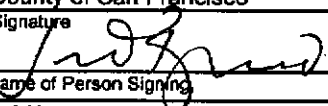
**California Integrated Waste Management Board  
Office of Local Assistance  
1001 I Street, (MS-25)  
PO Box 4025  
Sacramento, CA 95812-4025**

**General Instructions:**

Please select the **ONE** choice below that best explains your request to the Board.

- ☒ 1. Use a recent generation-based study to calculate our current reporting year generation amount, but not officially change our existing Board-approved base year.
- ☐ 2. Use a recent generation-based study to officially change our existing Board-approved base year to a new base year.

The shaded cells on these sheets are protected. If you have problems using these sheets, please contact your Office of Local Assistance representative by calling (916) 341-6199.

Section I: Jurisdiction Information and Certification			
All respondents must complete this section.			
I certify under penalty of perjury that the information in this document is true and correct to the best of my knowledge, and that I am authorized to make this certification on behalf of:			
Jurisdiction Name		County	
City and County of San Francisco		San Francisco	
Authorized Signature		Title	
		Director, Department of the Environment	
Type/Print Name of Person Signing		Date	Phone ( ) Include Area Code
Jared Blumenfeld		12/10/01	(415) 554-3439
Person Completing This Form (please print or type)		Title	
Robert Haley		Special Projects Recycling Coordinator	
Affiliation:	San Francisco Department of the Environment		
Mailing Address	City	State	ZIP Code
1145 Market Street, Suite 401	San Francisco	CA	94103
E-Mail Address robert_haley@ci.sf.ca.us			

**Section II: Information for New Generation-Based Study for Existing or New Base Year**

**Attach additional sheets if necessary—reference each response to the appropriate cell number (e.g., "4").**

*Note: New base years must be representative of a jurisdiction's disposal and diversion.*

<b>1. Current Board-approved existing base year:</b>	<b>2. Proposed new generation-based study year:</b>
1990	2000

**3. Explain how the proposed generation study year is representative of average annual jurisdiction disposal and diversion:**

The proposed generation study year uses the most recent, complete and accurate information available. The City contracted CalRecovery for the third year in a row to perform a diversion study. CalRecovery further refined their methodology, including properly accounting for restricted wastes and eliminating double-counting, and received data from 147 recycling organizations, more than twice that received in any previous survey. The City continues to rely on the Board's Disposal Reporting System for disposal figures.

**4. Enter diversion rate information below.**

<b>Diversion rate calculated using existing base year</b>	<b>a. 32 %</b>	<b>Diversion rate calculated using new generation-based study</b>	<b>b. 46 %</b>
<b>For existing base year pounds/person/day based on generation</b>	<b>8.2</b>	<b>For new generation based study pounds/person/day based on generation</b>	<b>11.4</b>
<b>Residential generation 31.4 %</b>	<b>Non-Residential generation 68.6 %</b>	<b>Residential generation 35.75 %</b>	<b>Non-Residential generation 64.25 %</b>
<b>Population existing generation-based study 723,959</b>		<b>Population new generation-based study 776,733</b>	

**5. If there is an increase from 4a to 4b, please explain how the new diversion rate is consistent with your current diversion implementation efforts. If the proposed new generation tonnage results in an increase in your pounds/person/day, please explain how this is consistent with your current diversion implementation efforts and provide any examples (e.g., change in jurisdiction's demographics).**

A major economic boom increased our pounds/person/day. Implementing a number of new and expanded programs kept diversion growth outpacing disposal growth, which increased our diversion rate.

**6. If the difference between the proposed diversion rates in 4a and 4b is greater than 5 percentage points, please explain the specific reasons for the difference. (For example: new/improved curbside diversion programs.)**

First, we have better diversion data. Second, Norcal Waste Systems and other companies greatly increased their recovery efforts. The Norcal companies doubled the number of diversion programs they operate and more than quadrupled their diversion tonnage. For example, commercial food collection and residential and small business Fantastic 3 are new programs, and other residential and commercial/industrial recycling and organics programs have been expanded.

Diversion Activity	Actual tons	Relative Percent to Total Generation	Specific Material Type(s) (List operation w/multiple materials in one box)	Specific Conversion Factor Used (if any) and Source	Type of Record and Location of Record
Please use the Board's program types. The program type glossary is online at: <a href="http://www.ci.wmtn.ca.gov/General/Pages/Co&lt;br/&gt;des/Reduce.htm">www.ci.wmtn.ca.gov/General/Pages/Co des/Reduce.htm</a>	(A)	(A/Total Generation)			
Other Residential Recycling (list each program separately)					
Subtotal, Residential Recycling	140513	8.7%			
Residential Composting Activities					
Green Waste Drop-off	2044	0.1%	Yard trimmings		Norcal diversion breakdown, Dept. of the Environment
Curbside Green Waste	4059	0.3%	Yard trimmings, food scraps and soiled paper		Norcal diversion breakdown, Dept. of the Environment
Christmas Tree Program	775	0.0%	Holiday trees		Norcal diversion breakdown, Dept. of the Environment
Other Residential Composting (list each program separately)					
Subtotal, Residential Composting	6878	0.4%			
Subtotal, Residential Diversion	147391	9.1%			
Non-Residential Source Reduction Activities					
Non-Residential Waste Audits*			See Section 9	See Section 9	See Section 9
Other Non-Residential Source Reduction (list each program separately)					
Subtotal, Non-Residential Source Reduction	0	0.0%			

Division Activity	Actual Tons	Relative Percent to Total Generation	Specific Material Type(s) (List operation with multiple materials to one box)	Specific Conversion Factor Used (if any) and Source	Type of Record and Location of Record
Please use the Board's program types. The program type glossary is online at: <a href="http://www.ciwmmb.ca.gov/LGCentral/Panels/Codes/Reduce.htm">www.ciwmmb.ca.gov/LGCentral/Panels/Codes/Reduce.htm</a>					
Recycling					
Non-Residential Waste Audits*			See Section 9	See Section 9	See Section 9
Other Non-Residential Recycling (list each program separately)					
Commercial On-Site Pickup	74204	1.5%	Paper, glass, metal, plastic, wood, etc.		Norcal diversion breakdown, Dept. of the Environment, and diversion study, CalRecovery
Commercial Self-Haul	5748	0.4%	Paper, glass, metal, plastic, wood, etc.		Norcal diversion breakdown, Dept. of the Environment
Subtotal Non-Residential Recycling	79952	1.9%			
Non-Residential Composting Activities					
Non-Residential Waste Audits*			See Section 9	See Section 9	See Section 9
Other Non-Residential Composting (list each program separately)					
Food Waste Composting	23090	1.4%	Food scraps, plant trimmings, soiled paper and waxed cardboard		Norcal diversion breakdown, Dept. of the Environment, and diversion study, CalRecovery
Commercial On-Site Greenwaste Pick-Up	17012	1.0%	Yard and tree trimmings, etc.		Norcal diversion breakdown, Dept. of the Environment, and diversion study, CalRecovery
Commercial Self-Haul Greenwaste	562	0.0%	Brush and street sweepings		Norcal diversion breakdown, Dept. of the Environment
Subtotal Non-Residential Composting	40664	2.4%			
Subtotal Non-Residential Diversion	120616	7.4%			
Residential/Non-Residential Diversion Activities					
ADC	5477	0.3%	Green material, mixed and other		Disposal reporting system, CIWMB
Sludge	91793	5.7%	Biosolids and grit		SF PUC biosolids summary, Dept. of the Environment, and disposal reporting system, CIWMB
Scrap Metal	3899	0.2%	Non-ferrous, white goods and other metals		Diversion study, CalRecovery
Construction and Demolition	379183	23.4%	Concrete, asphalt, dirt, etc.		Diversion study, CalRecovery, and disposal reporting system, CIWMB
Landfill Salvage					
Subtotal Residential/Non-Residential Diversion	440353	29.6%			
Total Res/Non-Res Source Reduction Tons	0	0.0%			
Total Diversion Tons	745368	46.2%			
Total Disposal Tons from Sec.7	872731	53.8%			
Total Generation Tons (Div+Dis)	1621091				
Diversion Rate	46%				

Division Activity	Actual tons	Relative Percent to Total Generation	Specific Material Types (List operation with multiple materials in one box)	Specific Conversion Factor (used if any) and Source	Type of Record and Location of Record
<p>Please use the Board's program types. The program type glossary is online at <a href="http://www.chenierelectric.com/Generation/ProgramTypes.htm">www.chenierelectric.com/Generation/ProgramTypes.htm</a></p>	(A)	M/Fuel Generation			

**9. Specific Non-Residential Sector Waste Audits—Top 10 Non-Residential Generators**

Please complete this table for the top 10 non-residential generators that were surveyed. List each non-residential generator separately from largest to smallest, based on total diversion tons. Audit reference number ties to your audit sheets.

(Table will perform all addition calculations).

Type of Non-Residential Generator	Audit Reference Number	Specific/Major Diversion Activities Include Material Type (e.g., paper recycling, grasscycling). (List activities on one line)	Source Reduction Tons	Recycling Tons	Composting Tons	Total Diversion Tons	Percent of Total Generation (Total Diversion Tons/Total Generation in Section 8)	Survey Method Phone (P) Mail (M) On-site (O) Other ____
Totals								

Also provide an attachment 9 which includes all of the generators surveyed. Include for each generator (use type of generator in lieu of specific business name) diversion activity and material type and associated tonnage for each diversion activity/material type, and applicable conversion factors/sources. Include copies of survey form(s) used.

Summarize the non-residential diversion activities for the top 10 generators quantification methodology, and applicable conversion factors and sources (e.g., cardboard recycling: quantified by monthly tonnage receipts provided by the contact person at the business).

N/A

10. For each restricted waste type (i.e., agricultural waste, inert solids, [e.g. concrete, asphalt, dirt, etc.] scrap metals and white goods [PRC section 41781.2]) and associated program, please provide the following information:

a. If the diversion program started on or after January 1, 1990, complete the following table.

**Note:** program name refers to one specific diversion program for that waste type (e.g., "Diversion conducted by city public waste dept."

Restricted Waste Type	Specific Program Name	Year Started	Tonnage
Inert Solids ▼	Inert Recycling Program	1996	379183
Scrap Metal ▼	Scrap Metal Recycling Program	1996	3899
Pull Down for Waste Types ▼			
Pull Down for Waste Types ▼			
Pull Down for Waste Types ▼			
Pull Down for Waste Types ▼			

b. If the diversion program started before January 1, 1990 - and if documentation on the program and waste type has not been approved by the Board - on a separate sheet marked "Attachment 10b", provide the documentation that indicates:

- How the diversion was the result of a local action taken by the jurisdiction, which specifically resulted in the diversion (PRC sec. 41781.2 [c] [1]).
- That the amount of that waste type diverted from the jurisdiction in 1990 was less than or equal to the amount of that waste type disposed at a permitted disposal facility by the jurisdiction in any year before 1990. (**Note:** this criterion is applicable to the entire jurisdiction, not to individual programs (PRC sec. 41781.2 [c] [2]). Please include documentation.
- That the jurisdiction is implementing, and will continue to implement, the diversion programs in its source reduction and recycling element.

**Note:** If documentation for a waste type and program has already been approved by the Board, you do not have to provide an attachment 10b for that waste type and program.

Instead please provide date of Board approval of previously submitted information.

(Date)

If documentation is not available, go to 10d.

c. If the diversion program started before January 1, 1990, and the documentation requested in 10b is available (but not yet approved by the Board), complete the table below for each program claimed:

Restricted Waste Type	Specific Program Name	New Base Year or Reporting Year Diversion Tonnage
Pull Down for Waste Types ▼		
Pull Down for Waste Types ▼		
Pull Down for Waste Types ▼		
Pull Down for Waste Types ▼		
Pull Down for Waste Types ▼		
Pull Down for Waste Types ▼		

d. If the diversion program started before January 1, 1990, and the documentation requested in 10b is not available, please complete the table below for each program claimed. **Note:** Only the difference between the new base year/reporting year and 1990 can be counted in the diversion rate calculation.

Restricted Waste Type	Specific Program Name	New Base Year or Reporting Year Tonnage	1990 Diversion Tonnage	Difference
Pull Down for Waste Types ▼				
Pull Down for Waste Types ▼				
Pull Down for Waste Types ▼				
Pull Down for Waste Types ▼				
Pull Down for Waste Types ▼				
Pull Down for Waste Types ▼				



# SOLID WASTE MANAGEMENT PROGRAM

RECYCLING PROGRAM • HAZARDOUS WASTE MANAGEMENT PROGRAM

WILLIE L. BROWN, JR.  
MAYOR

PAUL V. HORCHER  
DIRECTOR

October 11, 2000

STAFF COPY

Ms. Theresa Bober  
California Integrated Waste Management Board  
8800 Cal Center Drive  
Sacramento, CA 95826

RE: 1999 Annual Report

Dear Ms. Bober,

Enclosed is the 5<sup>th</sup> Annual Report for the City and County of San Francisco. The City and County of San Francisco is submitting a generation-based annual report to the California Integrated Waste Management Board for the 1999 Reporting Year. This year's annual report is similar to the 1998 annual report, which also used a generation-based methodology. CalRecovery, Inc., the firm commissioned to undertake the 1998 diversion study, has completed the 1999 diversion study. It is attached as Appendix A-5.

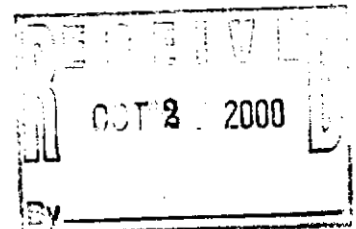
If you have any questions about the annual report or the diversion study please call me at (415) 554-3425.

Sincerely,

A handwritten signature in black ink, appearing to read "Peter Holtzclaw".

Peter Holtzclaw  
Recycling Program Manager

cc Paul Horcher, Director





**SECTION A: MEASUREMENT OF DIVERSION RATE**

Check each item as completed, providing attachments as applicable.

- ☒ A-1 Complete the diversion rate calculations using the Board-approved base-year generation amount and using the reporting-year disposal amount as reported from the disposal reporting system (the sum of the amounts provided from your county and from any other counties). Information on alternative adjustment factors used with hard copies of the source documents for each alternative factor should be attached. Table A-1a is a checklist for submitting data on alternative adjustment factors. Calculate modified reporting-year disposal in table A-1b.
- ☐ Information about alternative adjustment factors is provided in Table A-1a (below) and hard copies of the source documents for each alternative factor are attached.
- ☐ Attached is the Diversion Rate Calculation generated by On-Line Diversion Rate Measurement or DRM\*Plus and labeled as Appendix A-1. If adjustment factors were changed from the default numbers, the sources for the alternative numbers are indicated below in table A-1a.
- ☐ If reporting-year disposal was changed from the Disposal Reporting System amount, please document the data by completing the Reporting-Year Disposal Request Certification Sheets.

**Table A-1a: Data Sources for Alternative Adjustment Method Factors**

FACTOR	ALTERNATIVE SOURCE INFORMATION	
Population (# persons) <input type="checkbox"/> County level <input type="checkbox"/> Jurisdiction level	Base-Year	<input type="checkbox"/> Source: <input type="checkbox"/> Date: <input type="checkbox"/> Copy enclosed
	Reporting-Year	<input type="checkbox"/> Source: <input type="checkbox"/> Date: <input type="checkbox"/> Copy enclosed
Employment (# jobs) <input type="checkbox"/> County level <input type="checkbox"/> Jurisdiction level	Base-Year	<input type="checkbox"/> Source: <input type="checkbox"/> Date: <input type="checkbox"/> Copy enclosed
	Reporting-Year	<input type="checkbox"/> Source: <input type="checkbox"/> Date: <input type="checkbox"/> Copy enclosed
Taxable Sales (\$) <input type="checkbox"/> County level <input type="checkbox"/> Jurisdiction level	Base-Year	<input type="checkbox"/> Source: <input type="checkbox"/> Date: <input type="checkbox"/> Copy enclosed
	Reporting-Year	<input type="checkbox"/> Source: <input type="checkbox"/> Date: <input type="checkbox"/> Copy enclosed
Consumer Price Index <input type="checkbox"/> State level <input type="checkbox"/> Region level	Base-Year	<input type="checkbox"/> Source: <input type="checkbox"/> Date: <input type="checkbox"/> Copy enclosed
	Reporting-Year	<input type="checkbox"/> Source: <input type="checkbox"/> Date: <input type="checkbox"/> Copy enclosed

- ☒ A-2 a) Does the Board-approved base-year generation amount accurately represent your jurisdiction's base-year generation?

☒ Yes Go on to A-3.  
☐ No Attach a discussion and label as Appendix A-2a. Go on to b.

- b) If a more accurate base-year generation amount can be quantified, a jurisdiction may submit calculations for staff to consider during the Board's evaluation of your annual report. Board staff will compare the jurisdiction's default base-year to the jurisdiction's alternative base-year generation amount. Include a discussion on how this amount was derived and label this discussion Appendix A-2a. Label the diversion rate calculation attachment Appendix A-2b. Board direction only allows base-year corrections for 1997 or more recent years. Document base-year data by completing the Base-year Modification Request Certification form (CIWMB 628).

Revised Base-Year Generation = \_\_\_\_\_ tons

- ☒ A-3 a) Does the disposal amount, as reported from the disposal reporting system, accurately represent your jurisdiction's reporting-year disposal amount?

☐ Yes Go on to A-4.  
☒ No Attach a discussion and label as Appendix A-3a. Go on to b.

- b) If a more accurate reporting-year disposal amount can be quantified, a jurisdiction may submit calculations for staff to consider during the Board's evaluation of your annual report. Board staff will compare the jurisdiction's On-Line DRM default disposal amount to the jurisdiction's alternative amount. Include a discussion on how this amount was derived and label this discussion Appendix A-3a. Label the diversion rate calculation Appendix A-3b. Document reporting-year disposal data by completing the Reporting-Year Disposal Modification Request Certification Sheets.

Revised Reporting-Year Disposal = 780,059 tons.

- ☒ A-4. Is a regional medical waste treatment facility or a regional diversion facility located within your jurisdiction for which you have made a correction to the reporting-year disposal amount in Section A?

☐ Yes Discuss the waste types in the residual solid waste that cannot feasibly be diverted and any additional efforts undertaken to divert the waste produced at each facility. Explain why the adjustment should or should not still apply. Label attachment as Appendix A-4. Document reporting-year disposal data by completing the Reporting-Year Disposal Modification Request Certification Sheets.

☒ No

**OPTIONAL INFORMATION:**

- ☒ A-5. If a more accurate diversion rate can be quantified by a generation-based analysis and those calculations may be attached for staff to consider during the Board's evaluation. Include a discussion on how this amount was derived and label this discussion Appendix A-5. Label the diversion rate calculation Appendix A-5. Document generation-based analysis data by completing the Reporting-Year Disposal Modification Request Certification Form (CIWMB 628).

Revised Diversion Rate = 42.2 percent.

## Appendix A-3b

CCSF petitions for a disposal reduction of 26,633 tons. The majority of these tons - 25,220 - are Class II wastes that are by definition non-divertable. The remaining 1,413 tons are spread out around 9 different landfills. All are hundreds of miles from San Francisco. It is irrational to assume a hauler, or private individual, traveled from CCSF all the way to, for instance, Shasta County or Los Angeles County in order to dispose refuse. Common sense dictates that these wastes did not originate in CCSF, and therefore CCSF petitions that these wastes not be included in the CCSF disposal total.

## Appendix A-5

The City and County of San Francisco ("CCSF") is submitting a generation-based annual report to the California Integrated Waste Management Board for the 1999 Reporting Year. Based on concerns that the formula used to calculate diversion was dramatically underestimating actual diversion, CCSF commissioned a study to measure diversion through recycling for 1998. The 1999 study is similar to the 1998 study, the only difference being the inclusion of source reduction. The results of the study have been used to calculate diversion for 1999.

### Background

San Francisco's estimated diversion rate of 35% for 1990 was calculated based on documenting diversion and dividing this into the total of both documented disposal and diversion. The diversion total of 360,168 tons was calculated from a combination of curbside recycling totals, inert recycling, City department diversion, a confidential recycling survey conducted by Deloitte & Touche and a source reduction survey. Subsequent revisions to base year calculations raised the diversion total to 384,000 tons.

Since 1990, a number of new recycling programs have been established and expanded in the City and County of San Francisco. Norcal Waste Systems, Inc. quadrupled recycling between 1990 and 1998, increasing diversion from 50,000 tons per year to more than 200,000 tons per year. Norcal Waste Systems, Inc. operates eighteen different recycling programs in San Francisco, including seven pilot programs. More than half of these programs did not exist in 1990. Curbside recycling tonnage increased from 21,463 tons in 1990 to 62,311 tons in 1998. A number of other recycling companies expanded operations in San Francisco during the same time period. Yet diversion totals, extrapolated from the CIWMB formula, showed that San Francisco's diversion total was only 384,667 tons in 1997, basically the same tonnage as in 1990. This ran contrary to our analysis of the tonnage being collected through existing recycling programs.

In deciding to conduct a new recycling diversion study, we first evaluated the methodology used for the original Deloitte & Touche recycling survey conducted in preparation for calculating diversion for 1990. Deloitte & Touche sent surveys out to 79 companies, with 31 companies completing and returning the survey. Eight of the 31 companies were subsidiaries of Norcal Waste Systems, Inc., which meant that 24 companies responded to the survey. In Appendix D of San Francisco's Solid Waste Generation Study, shortcomings of

the survey were discussed. In particular, the study concluded, "a large portion of recycled paper volume seems to be unaccounted for." As a result of reviewing the 1990 information, the Solid Waste Management Program put together a much more extensive list of haulers and recyclers to be surveyed in the new study.

### 1999 Diversion Study: Methodology and Scope

CalRecovery, Inc. was selected to conduct the survey for the City and County of San Francisco. The study specifically addressed the recycling of waste-derived materials and diversion attributable to source reduction and reuse. The method for the study consisted of the preparation of a survey form and of a comprehensive mailing list of businesses involved in the recycling infrastructure in and around CCSF. 599 potential recycling businesses were surveyed. 105 responses were received; a return rate of 18% based on the net number of potential recycling businesses. Of the 105 completed surveys received, 65 contained diversion generated within CCSF. Source reduction surveys were mailed to 167 businesses, with 42 responding, for a return rate of approximately 25%. Of the 42 completed surveys, 15 contained quantities of materials reduced or reused in San Francisco. The only restricted materials included are quantities that are an increase from recycling levels in 1990, and CalRecovery used several methods to eliminate double counting of materials. A broader discussion of the survey's methodology is included with the Diversion Report in Appendix A-5a.

### 1999 Diversion Study: Results

The study identified 568,100 tons of material diverted from landfills for calendar year 1998. The total conservatively includes all ADC tonnage in the organic and special wastes accounted for in the diversion report, in order to eliminate any possibility of double counting. Source reduction accounts for about 600 additional diversion tons. The total diversion tonnage is therefore 568,700 tons. Combining diversion with disposal gives a total generation of 1,348,759 tons for 1999 and a diversion rate of 42.2%.

Diversion Study	Source Reduction	Total Diversion	Total Disposal	Total Generation	Diversion Rate
(tons)	(tons)	(tons)	(tons)	(tons)	(Percent)
568,100	600	568,700	780,059	1,348,759	42.2%

→ Tons Rounded. See Final Report Pages

**Final Report**

**Analysis of Diversion for the  
City and County of San Francisco  
for Calendar Year 1999**

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City and County of San Francisco  
October 2000

**Prepared for:**

City and County of San Francisco  
Solid Waste Management Program  
1145 Market Street, Suite 401  
San Francisco, California 94103

**By:**

CalRecovery, Inc.  
1850 Gateway Boulevard, Suite 1060  
Concord, California 94520

**CalRecovery**  
INCORPORATED



*Printed on Recycled Paper*

## **Final Report**

# **Analysis of Diversion for the City and County of San Francisco for Calendar Year 1999**

## **Introduction**

CalRecovery, Inc. conducted a survey of waste diversion programs for the purpose of estimating the quantities of wastes being recycled and reduced within the City and County of San Francisco (City) in calendar year 1999. The objectives of the diversion survey included establishing the current level of recycling in the city and identifying additional opportunities for reduction, reuse, and recycling of solid waste.

The diversion survey was divided into two separate, but similar, surveys: a survey of recycling and reuse programs and a survey of source reduction programs.

The methods and procedures for the recycling and reuse survey were identical to those used in the 1998 recycling survey [1]. A separate, but similar, set of methods and procedures was prepared for the source reduction survey. Both sets of methods and procedures are described in the main body of the report. Briefly, the survey methodology involved the preparation of a survey instrument that was mailed with a set of instructions to businesses and organizations in the recycling infrastructure, or to those anticipated to have source reduction programs, and the eventual compilation of the data received from the respondents.

## **Methodology**

### ***Recycling and Reuse***

The method for the analysis of recycling and reuse consisted of the preparation of a survey form and of a comprehensive mailing list of businesses and organizations involved in the recycling and reuse infrastructure in and around the City and County of San Francisco. The survey form and instructions were mailed to the addressees on the mailing list, along with a letter that explained the rationale for the survey and that requested the assistance and cooperation of the business or organization in completing the data sheet. A copy of the Materials Recycled data collection form is included in Appendix A. Data were solicited on the type of business or organization responding, and for 33 different material types. While the data collection form for material types and quantities was identical for both the recycling and reuse surveys, the format of the Type of Business form differed slightly to reflect the different composition of businesses and organizations between the two groups being surveyed. The data collection form was kept simple and short in order to increase the probability of a response, by minimizing the time required by the business to complete the survey form.

The instructional information accompanying the survey form included reporting examples and a due date for survey responses. To achieve the maximum participation in the survey, follow-up telephone calls were employed to solicit responses, in addition to those that were returned in the mail or by fax to CalRecovery. Addressees were told in the instructional materials that if they had questions, they should contact CalRecovery. Several businesses with questions placed calls to CalRecovery. The calls were returned, and the questions were answered.

Two important issues related to data quality were taken into account during the preparation of the data collection forms and during the analysis of the data that was received. One of the issues was the potential of double counting material quantities. Several methods were employed during the study to minimize the potential of double counting of quantities of recovered materials. The methods included: 1) soliciting information related to the general location of markets and to end users of the materials, and 2) information known or gained as part of the study concerning the recycling infrastructure in and around the City of San Francisco. The analysis of double counting was facilitated by the fact that San Francisco occupies a relatively small land mass and is on a peninsula. One result of these local conditions is that few end users of secondary materials are located within the boundary of the city and the numbers of processing facilities and haulers of materials is limited to a few. This type of situation simplifies the analysis of double counting of quantities.

The second important issue is proper data collection and reporting with regard to restricted material types. The instructions accompanying the recycling and reuse surveys clearly described the conditions relevant to reporting quantities of materials types that fall within the definition of restricted materials, as described in the applicable State of California regulations.

The reuse and recycling surveys were mailed to 599 businesses and organizations.

### ***Source Reduction***

The methods and procedures used for the source reduction survey closely paralleled those of the recycling and reuse surveys. A sampling of large businesses and organizations anticipated to have substantial source reduction were targeted for the survey.

The source reduction survey was mailed to 167 businesses and organizations.

### ***Reported Weight versus Volume Data***

Although data were solicited from businesses and organizations in the unit of tons (i.e., weight basis), in a number of cases respondents reported data in units other than weight. Some examples include cubic yards and number of items. Data reported in non-weight units were converted to a weight basis using appropriate conversion factors. Whenever feasible, conversion factors were taken from a conversion factor publication produced by CalRecovery for the California Integrated Waste Management Board [2] or from the Board's weight conversion charts [3]. In those cases where conversion factors were not available in References 2 or 3, CalRecovery used in-house information or other published sources to convert non-weight data to a weight basis. A listing of data received in non-weight units and



the associated conversion factors are given in Appendix B for the recycling and reuse survey and Appendix C for the source reduction survey.

## **Results**

### ***Recycling and Reuse***

As mentioned previously, approximately 600 businesses and organizations were surveyed, using a mailing list composed of potential recycling and reuse entities provided to CalRecovery by the City and others identified by CalRecovery using other sources of information. From the 600 potential respondents, 105 surveys were received via either mail or fax, or were completed by CalRecovery personnel based on data provided over the telephone by the respondents. Thus, the survey response was about 18%. Of the 105 completed surveys received, 65 contained quantity data. Thus, the number of businesses reporting relevant diversion quantities for 1999 corresponded to about 10% of the responses.

The data were compiled for each of the 33 material types (including the incorporation of volume data converted to weight) and subsequently adjusted for estimated double counting. The unadjusted (i.e., gross) compiled quantity is 624,930 tons. The estimated quantities that were double counted are 56,791 tons. Therefore, the net estimated recycling and reuse total for 1999 is 568,139 tons, or about 568,100 tons when rounded to the nearest 100 tons. A breakdown of the recycled and reused quantities by material type for 1999 is given in Table 1. The data presented in Table 1 includes 12,465 equivalent net tons of non-weighed recycled or reused materials.

The quantities of all paper subcategories accounted for about 25% of the total. Approximately 56% of the total quantities was categorized as special wastes, of which construction and demolition (C&D) wastes (e.g., concrete and dirt) and sewage sludge were the major constituents. Consequently, quantities of paper and special wastes are estimated to account for about 81% of the recycling and reuse that occurred within the city in 1999.

### ***Source Reduction***

As mentioned above, source reduction surveys were mailed to 167 businesses and organizations. Forty-two surveys were completed and returned via mail or fax, or as a consequence of follow-up telephone calls. The response rate to the survey was thus about 25%. Of the 42 completed surveys, 15 reported quantities of materials, or equivalently about 9% of the responses.

The data collected from respondents during the source reduction survey consisted of volumes and numbers of items. The manner of estimating the weights of the materials was similar to that used during the conduct of the recycling and reuse survey. A total of 563 tons of source reduction was estimated for calendar year 1999. A breakdown of the estimate is given in Appendix C. Of this total quantity, about 78% and 13%, respectively, are attributable to material reduction due to reuse of pallets and to reduction of quantity of paper used for newspaper publishing.

### **Total Diversion**

The total diversion, composed of the results of the recycling and reuse survey and of the source reduction survey, is estimated to be about 568,100, after rounding the results to the nearest 100 tons.

### **Conclusions**

The following are the key findings and conclusions of the analysis:

1. An estimated 568,100 tons of materials were recycled or reused by businesses and organizations in San Francisco in 1999. In addition, about 560 tons of source reduction is estimated to have occurred during the same time period. Thus, the total diversion for 1999 is estimated to be about 568,700 tons, rounded to the nearest 100 tons.
2. The survey response was about 18% and 25%, respectively, for the recycling and reuse survey and for the source reduction survey, based on the businesses and organizations targeted by the survey process.
3. Recycling of paper and of special wastes in 1999 accounted for about 25% and 56%, respectively, of the total diversion estimated by this analysis. The diversion of these two generic types of solid waste represented about 81% of the total diversion estimated for 1999.

### **References**

1. *Analysis of Diversion for the City and County of San Francisco for Calendar Year 1998*, prepared by Cal Recovery, Inc., for the City and County of San Francisco Solid Waste Management Program, San Francisco, California, August 1999
2. *Conversion Factors for Individual Material Types*, prepared by CalRecovery, Inc., for the California Integrated Waste Management Board, Sacramento, California, December 1991.
3. *Weight Conversion Charts, Appendix J, Diversion Study Guide Final Draft for Peer Review*, California Integrated Waste Management Board website, August 2000.

**Table 1. Summary of Results of San Francisco Diversion Study for Calendar Year 1999 (tons)**

Category	Gross	Net	Paper		
			Corrugated	Mixed	Ledger
Businesses (reported weights)	572,075	475,130	34,984	24,502	24,837
City departments (reported weights)	40,177	15,503	7	2	-
Estimated weights (based on volume-to-weight conversions) (a)	12,677	12,465	12	1	-
	624,930	503,097	34,983	24,505	24,837

**Footnotes:**

(a) Estimates for City departments and businesses.

**Table 1. Summary of Results of San Francisco Diversion Study for Calendar Year 1999 (tons)**

Category		
	News	Other
Businesses (reported weights)	59,365	627
City departments (reported weights)	-	-
Estimated weights (based on volume-to-weight conversions) (a)	-	-
	59,365	627
	Paper =	144,317
		25.4%

**Footnotes:**

(a) Estimates for City departments and businesses.

**Table 1. Summary of Results of San Francisco Diversion Study for Calendar Year 1999 (tons)**

Category	Glass			
	Beverage	CRV	Other container	Other
Businesses (reported weights)	4,475	5,835	12,365	261
City departments (reported weights)	-	-	-	4
Estimated weights (based on volume-to-weight conversions) (a)	-	-	0	13
	4,475	5,835	12,365	278
			Glass =	22,954
				4.6%

## Footnotes:

(a) Estimates for City departments and businesses.

Table 1: Summary of Results of San Francisco Diversion Study for Calendar Year 1999 (tons)

Category	Plastics			
	HDPE	PET	Film	Other
Businesses (reported weights)	588	599	347	1,125
City departments (reported weights)	-	-	-	-
Estimated weights (based on volume-to-weight conversions) (a)	-	-	-	-
	588	599	347	1,125
	Plastics =			2,659
				0.5%

Footnotes:

(a) Estimates for City departments and businesses.

**Table 1. Summary of Results of San Francisco Diversion Study for Calendar Year 1999 (tons)**

Category	Metals				
	Aluminum cans	Bi-metal	Ferrous	Non-ferrous	White goods
Businesses (reported weights)	1,051	326	2,728	3,682	773
City departments (reported weights)	12	-	277	44	-
Estimated weights (based on volume-to-weight conversions) (a)	-	-	-	-	-
	1,063	326	3,006	3,726	773
	Metals =				

**Footnotes:**

(a) Estimates for City departments and businesses.

**Table 1. Summary of Results of San Francisco Diversion Study for Calendar Year 1999 (tons)**

Category	Other
Businesses (reported weights)	8,828
City departments (reported weights)	917
Estimated weights (based on volume-to-weight conversions) (a)	
	9,745
	18,638
	3.7%

**Footnotes:**

(a) Estimates for City departments and businesses.



**Table 1. Summary of Results of San Francisco Diversion Study for Calendar Year 1999 (tons)**

Category	Organics					
	Yard	Food	Tires/ rubber	Wood	Ag crop	Manure
Businesses (reported weights)	4,593	23,142	481	20,890	-	-
City departments (reported weights)	2,054	0	-	8	-	-
Estimated weights (based on volume-to-weight conversions) (a)	5,501	21	19	232	-	6,250
	12,148	23,164	500	21,130	-	6,250
	Organics =					

**Footnotes:**

(a) Estimates for City departments and businesses.

**Table 1. Summary of Results of San Francisco Diversion Study for Calendar Year 1999 (tons)**

Category	Special					
	Textiles	Sewage sludge	Industrial sludge	Auto	Inerts	Other
Businesses (reported weights)	221	85,574	-	-	214,063	3,929
City departments (reported weights)	-	4,468	-	-	7,550	158
Estimated weights (based on volume-to-weight conversions) (a)	-	-	-	-	320	95
	221	90,042	-	-	221,934	4,181
	63,413				Special Waste	251,115
	12.6%					49.90%

Footnotes:

(a) Estimates for City departments and businesses.